7052.0100 WATER QUALITY STANDARDS.

Subpart 1. **Applicability.**

A. The ambient water quality standards in subparts 2 to 6 are class 2 standards for the protection of aquatic life, human health, and wildlife from the GLI pollutants. The numeric standard for a GLI pollutant includes the CS, MS, and FAV. Some pollutants do not have an MS or an FAV because of insufficient data. For these pollutants, the CS is the numeric standard. Additional standards applicable to the surface waters of the state in the Lake Superior basin are found in chapter 7050, including standards applicable to drinking water sources, which are listed in parts 7050.0220 and 7050.0221.

B. Some of the GLI pollutants listed in subparts 2 to 6 have both aquatic life and human health standards and four of the GLI pollutants have wildlife standards, as provided in tables 1 to 4 of the GLI Guidance. These standards are listed in subparts 2 to 6 to facilitate implementation of the standards under parts 7052.0200, subpart 3, and 7052.0210, subpart 1. The most stringent chronic aquatic life, human health, or wildlife standard listed is the applicable standard except when a less stringent chronic or maximum standard applies when setting an effluent limitation under part 7052.0200, subpart 3. For any aquatic life, human health, or wildlife chronic standard, a blank space in subparts 2 to 5 means no GLI standard is available and the most stringent listed chronic standard is applicable. For the aquatic life MS and FAV, blank spaces mean the GLI guidance lists no MS or FAV, and part 7050.0222 may contain an applicable MS or FAV.

C. The definitions and methods for human health-based chronic standards and site-specific chronic criteria in parts 7050.0217 to 7050.0219 are incorporated by reference and are further described in part 7052.0110, subpart 4.

D. The class 2A human health-based chronic standards listed in chapter 7050 are incorporated by reference as modified by the procedures in part 7052.0110, subpart 3.

E. The *Escherichia (E.) coli* water quality standards in Code of Federal Regulations, title 40, section 131.41, table (c)(1), that apply to coastal recreation waters are incorporated by reference as:

(1) *E. coli* bacteria must not exceed 126 organisms per 100 milliliters, as a geometric mean of not less than five samples representative of conditions during any calendar month; or

(2) *E. coli* bacteria must not exceed 235 organisms per 100 milliliters in more than ten percent of all the individual samples taken during any calendar month.

The *E. coli* standard under this item applies only between April 1 and October 31.

F. Standards for metals are expressed as total metal but must be implemented as dissolved metal standards. Conversion factors for converting total to dissolved metal standards are listed in part 7052.0360, and applied under part 7052.0200, subpart 4. The conversion factor for metals not listed in part 7052.0360 is one. Standards for GLI pollutants followed by (TH) or (pH) vary with total hardness or pH. The formulas for these standards are found in subpart 6.

G. The CS and MS are averaged over the following durations:

(1) the MS is a one-day average;

(2) the CS, based on toxicity to aquatic life, is a four-day average; and

(3) the CS applied in water, based on human health or wildlife toxicity, is a 30-day average.

Subp. 2. **Water quality standards applicable to Lake Superior; class 2A.**

Substance	Units	Aquatic Life Chronic Standard	Aquatic Life Maximum Standard	Aquatic Life Final Acute Value	Human Health Chronic Standard	Wildlife Chronic Standard	Applicable Chronic Standard
Arsenic, total	ug/l	148	340	680	2†		2
Benzene	ug/l				10		10
Cadmium, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chlordane	pg/l				40		40
Chlorobenzene	ug/l	10†	423†	846†	278		10
Chromium III, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chromium VI, total	ug/l	11	16	32			11
Copper, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Cyanide, free	ug/l	5.2	22	44	596		5.2
DDT	pg/l				25	11	11
Dieldrin	pg/l	56000	240000	480000	1.2		1.2
2,4-Dimethylphenol	ug/l	21	137	274	368		21
2,4-Dinitrophenol	ug/l	71	379	758	53		53
Endrin	ug/l	0.036	0.086	0.17	0.0039†		0.0039
Hexachlorobenzene	pg/l				74		74
Hexachloroethane	ug/l				1.0		1.0
Lindane	ug/l		0.95	1.9	0.08		0.08
Mercury, total	ug/l	0.91	1.7	3.4	0.00153	0.0013	0.0013
Methylene Chloride	ug/l				46		46
Nickel, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Parathion	ug/l	0.013	0.065	0.13			0.013
PCBs (class)	pg/l				4.5	122	4.5
Pentachlorophenol (pH)	ug/l		subp 6	subp 6	0.93†		0.93
Selenium, total	ug/l	5.0	20†	40†			5.0
2,3,7,8-TCDD	pg/l				0.0014	0.0031	0.0014

Toluene	ug/l	253†	1352†	2703†	3725		253
Toxaphene	pg/l				11		11
Trichloroethylene	ug/l				22		22
Zinc, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6

†this standard or FAV was derived under chapter 7050.

Subp. 3. **Water quality standards applicable to class 2A waters other than Lake Superior.**

Substance	Units	Aquatic Life Chronic Standard	Aquatic Life Maximum Standard	Aquatic Life Final Acute Value	Human Health Chronic Standard	Wildlife Chronic Standard	Applicable Chronic Standard
Arsenic, total	ug/l	148	340	680	2†		2
Benzene	ug/l				11		11
Cadmium, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chlordane	pg/l				56		56
Chlorobenzene	ug/l	10†	423†	846†	324		10
Chromium III, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chromium VI, total	ug/l	11	16	32			11
Copper, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Cyanide, free	ug/l	5.2	22	44	596		5.2
DDT	pg/l				35	11	11
Dieldrin	pg/l	56000	240000	480000	1.6		1.6
2,4-Dimethylphenol	ug/l	21	137	274	391		21
2,4-Dinitrophenol	ug/l	71	379	758	53		53
Endrin	ug/l	0.036	0.086	0.17	0.0039†		0.0039
Hexachlorobenzene	pg/l				105		105
Hexachloroethane	ug/l				1.5		1.5
Lindane	ug/l		0.95	1.9	0.11		0.11
Mercury, total	ug/l	0.91	1.7	3.4	0.00153	0.0013	0.0013
Methylene Chloride	ug/l				46		46
Nickel, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Parathion	ug/l	0.013	0.065	0.13			0.013
PCBs (class)	pg/l				6.3	122	6.3
Pentachlorophenol (pH)	ug/l		subp 6	subp 6	0.93†		0.93
Selenium, total	ug/l	5.0	20†	40†			5.0
2,3,7,8-TCDD	pg/l				0.0020	0.0031	0.0020
Toluene	ug/l	253†	1352†	2703†	4214		253

Toxaphene	pg/l				15		15
Trichloroethylene	ug/l				24		24
Zinc, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6

†this standard or FAV was derived under chapter 7050.

Subp. 4. **Water quality standards applicable to class 2Bd waters.**

Substance	Units	Aquatic Life Chronic Standard	Aquatic Life Maximum Standard	Aquatic Life Final Acute Value	Human Health Chronic Standard	Wildlife Chronic Standard	Applicable Chronic Standard
Arsenic, total	ug/l	148	340	680	2†		2
Benzene	ug/l				12		12
Cadmium, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chlordane	pg/l				225		225
Chlorobenzene	ug/l	10†	423†	846†	461		10
Chromium III, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chromium VI, total	ug/l	11	16	32			11
Copper, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Cyanide, free	ug/l	5.2	22	44	596		5.2
DDT	pg/l				142	11	11
Dieldrin	pg/l	56000	240000	480000	6.5		6.5
2,4-Dimethylphenol	ug/l	21	137	274	441		21
2,4-Dinitrophenol	ug/l	71	379	758	55		55
Endrin	ug/l	0.036	0.086	0.17	0.016†		0.016
Hexachlorobenzene	pg/l				418		418
Hexachloroethane	ug/l				5.0		5.0
Lindane	ug/l		0.95	1.9	0.43		0.43
Mercury, total	ug/l	0.91	1.7	3.4	0.00153	0.0013	0.0013
Methylene Chloride	ug/l				47		47
Nickel, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Parathion	ug/l	0.013	0.065	0.13			0.013
PCBs (class)	pg/l				25.2	122	25.2
Pentachlorophenol (pH)	ug/l		subp 6	subp 6	1.9†		1.9
Selenium, total	ug/l	5.0	20†	40†			5.0
2,3,7,8-TCDD	pg/l				0.0080	0.0031	0.0031
Toluene	ug/l	253†	1352†	2703†	5517		253
Toxaphene	pg/l				62		62

Trichloroethylene	ug/l				29		29
Zinc, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6

†this standard or FAV was derived under chapter 7050.

Subp. 5. **Water quality standards applicable to class 2B and 2D waters.**

Substance	Units	Aquatic Life Chronic Standard	Aquatic Life Maximum Standard	Aquatic Life Final Acute Value	Human Health Chronic Standard	Wildlife Chronic Standard	Applicable Chronic Standard
Arsenic, total	ug/l	148	340	680	53†		53
Benzene	ug/l	114†	4487†	8974†	237		114
Cadmium, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chlordane	pg/l				225		225
Chlorobenzene	ug/l	10†	423†	846†	2916		10
Chromium III, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Chromium VI, total	ug/l	11	16	32			11
Copper, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Cyanide, free	ug/l	5.2	22	44	30240		5.2
DDT	pg/l				142	11	11
Dieldrin	pg/l	56000	240000	480000	6.5		6.5
2,4-Dimethylphenol	ug/l	21	137	274	7182		21
2,4-Dinitrophenol	ug/l	71	379	758	1982		71
Endrin	ug/l	0.036	0.086	0.17	0.016†		0.016
Hexachlorobenzene	pg/l				419		419
Hexachloroethane	ug/l				6.2		6.2
Lindane	ug/l		0.95	1.9	0.46		0.46
Mercury, total	ug/l	0.91	1.7	3.4	0.00153	0.0013	0.0013
Methylene Chloride	ug/l	1561†	9600†	19200†	1994		1561
Nickel, total (TH)	ug/l	subp 6	subp 6	subp 6			subp 6
Parathion	ug/l	0.013	0.065	0.13			.013
PCBs (class)	pg/l				25.2	122	25.2
Pentachlorophenol (pH)	ug/l	subp 6	subp 6	subp 6	5.5†		subp 6
Selenium, total	ug/l	5.0	20†	40†			5.0
2,3,7,8-TCDD	pg/l				0.0080	0.0031	0.0031
Toluene	ug/l	253†	1352†	2703†	45679		253
Toxaphene	pg/l				62		62
Trichloroethylene	ug/l				330		330

Zinc, total (TH)	ug/l	subp 6	subp 6	subp 6		subp 6

†this standard or FAV was derived under chapter 7050.

Subp. 6. **Water quality standards that vary with water quality characteristics.**

A. Class 2 standards that vary with total hardness (TH) applicable to all surface waters of the state in the Lake Superior basin are listed in this subpart. Total hardness is the sum of the calcium and magnesium concentrations expressed as calcium carbonate in mg/l. For ambient or effluent total hardness values greater than 400 mg/l, 400 mg/l must be used in the calculation of the standard. Exp. is the base e exponential function.

		Example standards at hardness of:				
Cadmium, total	Formula, results in ug/l	50	100	200	300	400
Chronic standard	exp.(0.7852[ln (TH mg/l)]-2.715)	1.4	2.5	4.2	5.8	7.3
Maximum standard	exp.(1.128[ln (TH mg/l)]-3.6867)	2.1	4.5	9.9	16	22
Final acute value	exp.(1.128[ln (TH mg/l)]-2.9935)	4.1	9.0	20	31	43

		Example standards at hardness of:				
Chromium III, total	Formula, results in ug/l	50	100	200	300	400
Chronic standard	exp.(0.819[ln (TH mg/l)]+0.6848)	49	86	152	212	268
Maximum standard	exp.(0.819[ln (TH mg/l)]+3.7256)	1022	1803	3181	4434	5612
Final acute value	exp.(0.819[ln (TH mg/l)]+4.4187)	2044	3606	6362	8867	11223

		Example standards at hardness of:				
Copper, total	Formula, results in ug/l	50	100	200	300	400
Chronic standard	exp.(0.8545[ln (TH mg/l)]-1.702)	5.2	9.3	17	24	30
Maximum standard	exp.(0.9422[ln (TH mg/l)]-1.700)	7.3	14	27	39	52
Final acute value	exp.(0.9422[ln (TH mg/l)]-1.0069)	15	28	54	79	103

		Example standards at hardness of:				
Nickel, total	Formula, results in ug/l	50	100	200	300	400
Chronic standard	exp.(0.846[ln (TH mg/l)]+0.0584)	29	52	94	132	169
Maximum standard	exp.(0.846[ln (TH mg/l)]+2.255)	261	469	843	1188	1516
Final acute value	exp.(0.846[ln (TH mg/l)]+2.9481)	522	938	1687	2377	3032

		Example standards at hardness of:				
Zinc, total	Formula, results in ug/l	50	100	200	300	400

Chronic standard	exp.(0.8473[ln (TH mg/l)]+0.884)	67	120	216	304	388
Maximum standard	exp.(0.8473[ln (TH mg/l)]+0.884)	67	120	216	304	388
Final acute value	exp.(0.8473[ln (TH mg/l)]+1.5772)	133	240	431	608	776

B. Standards that vary with pH applicable to Lake Superior, other class 2A and 2Bd waters in the Lake Superior basin are listed in this subpart. Exp. is the base e exponential function.

		Example standards at pH of:				
Pentachlorophenol	Formula, results in ug/l	6.5	7.0	7.5	8.0	8.5
Maximum standard	exp.(1.005[pH]-4.869)	5.3	8.7	14	24	39
Final acute value	exp.(1.005[pH]-4.175)	11	17	29	48	79

C. Standards that vary with pH applicable to class 2B and 2D waters in the Lake Superior basin are listed in this subpart. Exp. is the base e exponential function.

		Example standards at pH of:				
Pentachlorophenol	Formula, results in ug/l	6.5	7.0	7.5	8.0	8.5
Chronic standard	exp.(1.005[pH]-5.134) not to exceed 5.5 ug/l	4.0	5.5	5.5	5.5	5.5
Maximum standard	exp.(1.005[pH]-4.869)	5.3	8.7	14	24	39
Final acute value	exp.(1.005[pH]-4.175)	11	17	29	48	79

Statutory Authority: *MS s 115.03; 115.44*

History: *22 SR 1466; 39 SR 1344; 42 SR 441*

Published Electronically: *November 20, 2017*